Catalogue of American Amphibians and Reptiles.

NELSON, CRAIG E. 1972. *Gastrophryne usta.*

Gastrophryne usta (Cope)
Two-spaded narrow-mouthed toad

Engystoma carolinensis (part): Günther, 1859:51–52.
Engystoma "spec n. ?": Müller 1878:583.
Engystoma ustum Cope, 1866:131. Type-locality "Guadalaxara" (= Guadalajara), Jalisco, Mexico, apparently in error. Emended to Tecoman, Colima, Mexico by Nelson (ms.). Type by museum records, U. S. Natl. Mus. 24965, sex? (macerated and disarticulated; examined by author), collected by Major.
Systoma ustum: Cope, 1867:194.
Engystoma mexicanum Peters, 1870:881. Type-locality "warmeren Gegenden Mexicos (Matomoros u. a. o.)" [warmer parts of Mexico (Matamoros and other areas)]. Restricted to "[Izucar de] Matamoros, Puebla" by Taylor and Smith (1950). Type by museum records, Zool. Mus. Humbolt-Univ. Berlin 6667, "Mexico," sex?, (examined by author), collected by Berkenbusch.
Euphemphix gadovii Boulenger 1903:552. Type-locality, "San Mateo del Mar" near Tehuantepec, Oaxaca, Mexico. Syntypes by museum records, British Museum (Nat. Hist.) 1903.9.30.259–261 (reregister 1947.2.11.54–56), 3 juveniles (one examined by author), collected by Dr. and Mrs. Gadow.
Gastrophryne usta: Stejneger, 1910:166.
Gastrophryne usta [gadovii]: Stejneger 1910:166—by fiat.
Engystoma usta: Nieden 1926:64, 66.
Microhyla usta: Parker, 1934:126, 148–149.
Microhyla usta usta: Taylor and Smith, 1945:602–603.
Microhyla usta gadovii: Taylor and Smith, 1945:603.
Microhyla gadovii: Maldonado-Koerdell, 1953:117.
Gastrophryne usta usta: Carvalho, 1954:13.
Gastrophryne usta gadovii: Carvalho, 1954:13.
Gastrophryne usta gadowi: Duellman, 1960:67.
Gastrophryne usta retifera Lynch, 1965:387–99. Type-locality "near San Andres Tuxtla, Veracruz, Mexico." Holotype, Univ. Illinois Mus. Nat. Hist. 20048, female (examined by author), collected Sept. 1935 by H. M. Smith and E. H. Taylor.

• CONTENT. I regard the species as monotypic (see comment).

• DEFINITION AND DIAGNOSIS. The only *Gastrophryne* with two metatarsal tubercles on each hind foot rather than only one. *G. usta* is more easily confused with *Hypopachus*, than with other *Gastrophryne*. *G. usta* has the toes free; *Hypopachus* has them webbed.

• DESCRIPTIONS. The better modern descriptions of adults include Nieden (1926), Parker (1934), Taylor and Smith (1945), Legler (1964), and Lynch (1965). Nelson and Altig (ms.) describe the tadpole and note that Taylor's (1942) description of tadpoles of "*Hypopachus alboventer*" may apply to this species. The eggs have not been described. Quantitative descriptions of the call are given by Fouquette and Rossman (1963) and Nelson (ms.).

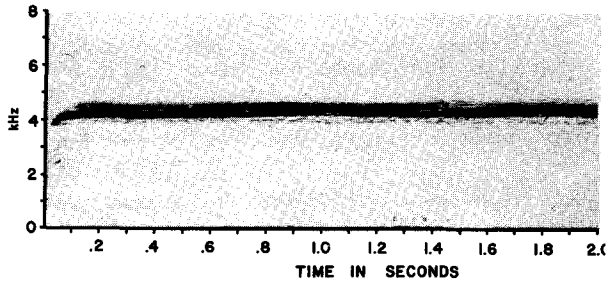


FIGURE. Audiospectrogram (narrow band, 45 Hz) of mating call of *Gastrophryne usta*: 3 km. E. Escuintla, Guatemala, 26 June 1967, air 23°C, water 26°C (C. Nelson recording in Amer. Mus. Nat. Hist. Dept. Herpetology tape library).

• ILLUSTRATIONS. Illustrations of adults are provided by Brocchi (1882, colored drawings), Taylor and Smith (1945, photographs), and Lynch (1965, photograph). Nelson and Altig (ms.) present a drawing of the tadpole. Taylor's (1942) figure of a "*Hypopachus alboventer*" tadpole may apply to this species. Nelson (1966) provides an audiospectrogram of the call. Willem (1941) figures myology.

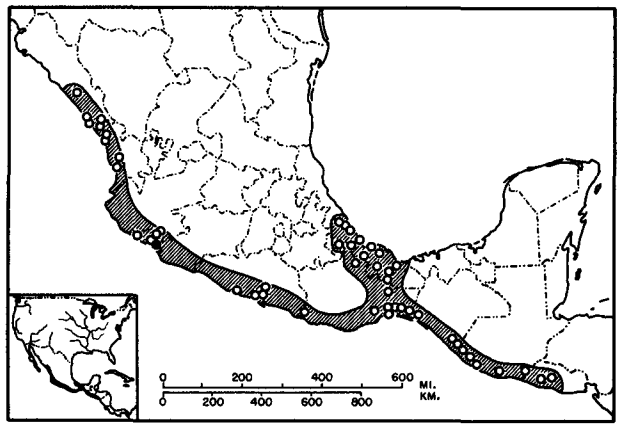
• DISTRIBUTION. *G. usta* occurs at low elevations (generally below 500 m., recorded to 980 m.) of the Pacific versant from Sinaloa, Mexico, to El Salvador and of the Atlantic versant of the Isthmus of Tehuantepec and adjacent areas in Oaxaca and Veracruz, Mexico. It inhabits predominantly open, grassy, thorn forest. For known localities, see Nelson (ms.). Other marginal and summary listings are Taylor and Smith (1945, Mexico), Smith and Taylor (1948, Mexico), Hardy and McDiarmid (1969, Sinaloa), Altig (1964, Nayarit), Oliver (1937, Colima), Davis and Dixon (1965, Guerrero), Duellman (1960, Isthmus of Tehuantepec), Legler (1964, El Salvador) and Nelson and Cuellar (1968, El Salvador). Published records (including the nominate type-locality) for the Lerma-Chapala system and other records from above 1000 m. are spurious (Nelson, ms.).

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Nelson (1966) gives a full synonymy. Taylor and Smith (1945), Lynch (1965), and Nelson (ms.) discuss geographic variation. Willem (1941) comments on myology. Nelson and Cuellar (1968) discuss tadpole internal anatomy. Sumichrast (1880) discusses amplexus, including nuptial adhesion, and cites specimens from under trunks. Fugler and Webb (1957) found specimens under a log and a palm frond. Smith (1947) and Nelson (ms.) report stomach contents (ants). Davis and Dixon (1965) found gravid females in June. Pyburn (1963) reports calling in July and August (once at 26.5°C). Hardy and McDiarmid (1969) describe the call and calling behavior (from under cover near but not in pools of water), and report chorusing and gravid females in July and chorusing in August. Nelson (ms.) tabulates call parameters and chorus temperatures.

• ETYMOLOGY. The original form, *ustum*, is the past participle of the Latin verb *uro*, to "burn"; perhaps it was evoked by the coloration of the type (burnt-red coloration is common).

• REMARKS. Whether the type of *Engystoma ustum* is a juvenile *Hypopachus* with possibly correct locality data or a *Gastrophryne usta* (in the sense used herein) with incorrect locality data cannot be directly ascertained because of the deteriorated condition of the type, but Cope's (1866) statement that the type had no webs indicates that it is indeed what is now called *G. usta*. Müller's (1878) "*Engystoma spec. n.?*" is relegated by him (1884) to this species without any description, an assignment not subsequently confirmed. Parker (1934) lists Günther's (1859) use of *Engystoma rugosum* in the synonymy of *G. usta*, but the only specimen Günther cites has "talon with a single tubercle." Taylor and Smith's (1950)



MAP. The solid circle marks the emended type-locality; open circles indicate other records.

restriction of the type locality of *E. mexicanum* places it outside the presently known range of *G. usta.*

Comment

Smith and Taylor (1948, also Taylor and Smith, 1945) recognize two subspecies: *G. usta usta* from "Sinaloa and central Veracruz southward to near the Isthmus of Tehuantepec" and *G. u. gadovii* from "Oaxaca and Chiapas." They separate these races, respectively, as: "no hair-fine line on back or posterior surface of leg; larger" *versus* "hair-fine line from tip of snout to anus; a similar line from anus along posterior surface of leg to foot; smaller." Lynch (1965) recognizes two subspecies, one characterized by "dark reticulations on the chest and belly of males and lighter reticulations in females," smaller size, and "the frequent presence" of hair-fine light stripes on the back and legs, the other not explicitly characterized. He discusses ventral coloration but gives no data on other characters. Specimens from around the city of Tehuantepec (the type locality of *gadovii*) are intermediate in ventral coloration; Lynch concludes that the "only unequivocal solution seems to be to regard . . . *gadovii* as synonymous with *usta* and to name . . . a new race" (*G. u. retifera*; type locality in Veracruz). Nelson (ms.) tabulates body size, hair-fine stripes, and intensity of ventral reticulation. Males average about 21 mm. in Chiapas and Central America and about 23 to 24 mm. elsewhere. A hair-fine middorsal stripe is rare in most populations from Mexico north and west of Oaxaca (except in Sinaloa) and is present in a large majority of specimens from Oaxaca, Chiapas, and Central America and in a small majority of those from Veracruz and Sinaloa. Leg stripes are rare in Mexico west and north of Oaxaca and in Veracruz and northern Oaxaca, but are generally present in southern Oaxaca, Chiapas and Central America. An abdominal reticulum is visible in 70% of specimens from northwestern Mexico (moderate to dark in 25%) and in about 90% (moderate to dark in about 67%) of those from Veracruz and from southeastern areas. Veracruz and northern Oaxacan populations thus are: intermediate in middorsal stripe frequency, like northwestern populations in usually lacking leg stripes, like southeastern populations in ventral coloration, and similar to extreme northwestern populations in size. If subspecies were recognized, the obvious choices would be *gadovii* and *usta* (with the Veracruz and northern Oaxaca populations, and with them *retifera* and perhaps *mexicanum*, regarded as intermediate). It seems best not to recognize subspecies because the area occupied by intermediate populations is relatively large and because the characters are somewhat mosaic in their distribution (middorsal stripe common in Sinaloa and in the southeast but rare in between; slightly larger mean size in Veracruz, and Sinaloa).

Literature Cited

Altig, Ronald. 1964. Noteworthy records of anurans from Mexico. Herpetologica 20 (3):210–211.

Boulenger, G. A. 1903. Descriptions of new batrachians in the British Museum. Ann. Mag. Nat. Hist. Series 7, 12:552–557.

Brocchi, Paul M. 1881–1882. Etudes des batraciens de l'Amerique Central. *In* Mission scientifique au Mexique et dans l'Amerique Central. Part 3, Sec. 2 (1881–1883): 1–122.

Carvalho, Antenor Leitão de. 1954. A preliminary synopsis of the genera of American microhylid frogs. Occ. Pap. Mus. Zool. Univ. Michigan. (555):1–19.

Cope, Edward D. 1866. Fourth contribution to the herpetology of tropical America. Proc. Acad. Nat. Sci. Philadelphia 1866:123–132.

— 1867. On the families of raniform Anura. J. Acad. Nat. Sci. Philadelphia Ser. 2, 6:189–206.

Davis, William B. and James R. Dixon. 1965. Amphibians of the Chilpancingo region, Mexico. Herpetologica 20 (4):225–233.

Duellman, William E. 1960. A distributional study of the amphibians of the Isthmus of Tehuantepec, Mexico. Univ. Kansas Publ. Mus. Nat. Hist. 13:19–72.

Fouquette, M. J., Jr. and Douglas A. Rossman. 1963. Noteworthy records of Mexican amphibians and reptiles in the Florida State Museum and the Texas Natural History Collection. Herpetologica 19 (3):185–201.

Fugler, Charles M. and Robert G. Webb. 1957. Some noteworthy reptiles and amphibians from the states of Oaxaca and Veracruz. Herpetologica 13 (2):103–108.

Günther, Albert C. L. 1859. Catalogue of the Batrachia Salientia in the collection of the British Museum. Publ. British Mus. (Nat. Hist.), London. xvi + 160 p.

Hardy, Lawrence M. and Roy W. McDiarmid. 1969. The amphibians and reptiles of Sinaloa, Mexico. Univ. Kansas Publ. Mus. Nat. Hist. 18:39–252.

Kellogg, Remington. 1932. Mexican tailless amphibians in the U. S. National Museum. Bull. U. S. Natl. Museum (160): iv + 224 p.

Legler, John M. 1964. A narrow-mouthed toad (*Gastrophryne usta*) in El Salvador. Herpetologica 19 (4):286–287.

Lynch, John D. 1965. The races of the microhylid frog *Gastrophryne usta*, in Mexico. Trans. Kansas Acad. Sci. 63:396–400.

Maldonado-Koerdell, M. 1953. Anfibios, p. 1107–120. *In* Enrique Beltran (ed.), Vida silvestre y recursas naturales a lo Largo de la Carretera Panamericana. Instituto Mexicano de recursas naturales renovables, iv + 238 p.

Müller, F. 1878. Katalog der im Museum und Universitätskabinet der Basel aufgestellten Amphibien und Reptilien nebst Anmerkungen. Verhand. Natur. Gesell. Basel 6:559–709.

— 1884. Dritter Nachtrag zum katalog der herpetologischen Sammlung des Basler Museums. *Ibid.* 8:274–299.

Nelson, Craig E. [Ms.] Systematic Studies of the North American microhylid genus, *Gastrophryne*. J. Herpetol. (accepted for publication).

—, and Ronald Altig. [Ms.] Tadpoles of the microhylids *Gastrophryne elegans* and *G. usta*. Manuscript submitted.

—, and Hector S. Cuellar. 1968. Anatomical comparison of tadpoles of the genera *Hypopachus* and *Gastrophryne*. Copeia 1968:423–424.

Nieden, Fritz. 1926. Amphibia. Anura. II, Engystomatidae. Tierreich (49): xvi + 110 p.

Oliver, James A. 1937. Notes on a collection of amphibians and reptiles from the state of Colima, Mexico. Occ. Papers Mus. Zool. Michigan (360):1–28.

Parker, Hampton W. 1934. A monograph of the frogs of the family Microhylidae. Publ. British Mus. (Nat. Hist.), London, vii + 208 p.

Peters, W. 1870. Eine Mittheilung über mexicanische Amphibien, welche Hr. Berkenbuch in Puebla auf Veranlassung des Hrn. Legationsraths Von Schlozer dem Zoologischen Museum gesandt hat. Monatsberichte Akad. Wiss. Berlin 1869:874–881.

Pyburn, William F. 1963. Observations on the life history of the tree frog *Phyllomedusa callidryas* (Cope). Texas J. Sci. 14:155–170.

Smith, Hobart M. 1947. Notes on Mexican amphibians and reptiles. J. Washington Acad. Sci. 37:408–412.

—, and Edward H. Taylor. 1948. An annotated checklist and key to the Amphibia of Mexico. Bull. U. S. Natl. Mus. (194): iv + 118.

Stejneger, Leonhard H. 1910. The amphibian generic name *Engystoma* untenable. Proc. Biol. Soc. Washington 23: 165–168.

Sumichrast, Francois. 1880. Contribution a l'histoire Naturelle du Mexique 1. Notes sur une collection des reptiles et des batraciens de la partie occidentale de la Isthme de Tehuantepec. Bull. Zool. Soc. France 5:162–190.

Taylor, Edward H. and Hobart M. Smith. 1945. Summary of the collections of amphibians made in Mexico under the Walter Rathbone Bacon Traveling Scholarship. Proc. U. S. Natl. Museum 95 (3185):521–613.

—, and — 1950. Type localities of Mexican reptiles and amphibians. Univ. Kansas Sci. Bull. 33 (pt. 2, no. 8): 313–380.

Willem, Victor. 1941. Observaciones anatomiques sur quelques anoures brevicipides. Bull. Mus. Nat. Hist. Belgique 17:23.

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